

WHAT IS CLAIMED IS:

1. A multilayer film comprising a substrate bearing an aligned liquid crystal layer wherein the liquid crystal layer contains an onium salt represented by formula (I):



I

wherein:

each R is an independently selected straight, branched or cyclic alkyl group or an aromatic group and b is 2, 3, or 4;

M⁺ is a cation chosen from periodic group Va, VIa, and VIIa of the Periodic Table of Elements; and X⁻ is a counter-ion;

provided the salt may be present as an oligomeric or polymeric form of the salt.

2. The film of claim 1 wherein at least one R group is an alkyl group of 1-25 carbon atoms.

3. The film of claim 1 wherein at least one R group is an alkyl group of 1-6 carbon atoms.

4. The film of claim 1 wherein at least one R group is an aromatic group comprising 1 or 2 fused rings.

5. The film of claim 1 wherein at least one R group is an aryl group.

6. The film of claim 1 wherein at least one R group is a heteroaryl group.

7. The film of claim 1 wherein at least one R group is a phenyl group.
8. The film of claim 1 wherein M is a cation chosen from group VIa, and VIIa.
9. The film of claim 1 wherein M is a cation chosen from group VIIa.
10. The film of claim 1 wherein M is iodonium.
11. The film of claim 1 wherein X is a counterion whose conjugate acid has a pKa of less than 10.
12. The film of claim 1 wherein X is a counterion whose conjugate acid has a pKa of less than 5.
13. The film of claim 1 wherein X is selected from the group consisting of PF_6^- , CF_3COO^- , BF_4^- , and $\text{C}_6\text{H}_{12}\text{SO}_3^-$.
14. The film of claim 1 wherein the M is a member of a 5- or 6-membered ring fused to one or ore of the R groups.
15. The film of claim 1 wherein the salt is present in amount sufficient to improve the tilt without changing the refractive index of the layer by more than 10 percent.
16. The film of claim 1 wherein the amount of salt is sufficient to increase the tilt by at least 10% compared to the layer with no onium salt.
17. The film of claim 1 containing up to 10 wt % onium salt in the layer.

18. The film of claim 1 containing less than 2 wt. % onium salt in the layer.
19. A liquid crystal display comprising the film of claim 1.
20. A process for forming an alignment layer having a predetermined tilt comprising adding a predetermined amount of an onium salt to a coating solution, coating a substrate with the coating solution, and drying the coating.